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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,306	07/03/2002	Donald F. Hooper	10559-303US1	1999

7590 12/21/2004  
Fish & Richardson  
225 Franklin Street  
Boston, MA 02110-2804

EXAMINER

PAN, DANIEL H

ART UNIT	PAPER NUMBER
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2183

DATE MAILED: 12/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/069,306	<b>Applicant(s)</b> HOOPER ET AL.	
	<b>Examiner</b> Daniel Pan	<b>Art Unit</b> 2183	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5,8,11,15-20 and 22-25 is/are rejected.
- 7) ☒ Claim(s) 6,7,9,10,12-14 and 21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>06/04/04,02/21/02</u> . | 6) <input type="checkbox"/> Other: _____  |

1. Claims 1-25 are presented for examination.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 15,16, 20, 22,24 are rejected under 35 U.S.C. 102(a) and (b) as being anticipated by Moller et al. (4,868,735).

3. As to claims 1,15,16, Moller disclosed a system including at least a swap instruction [swap microinstruction] that swaps a currently running context in a specified microengine (see fig.2A,B) out to memory to let another context [invoked loop] to execute in that microengine and causes a different context [invoked loop] and associated program counter to be selected (see the selection and the replacement of the invoked loop count for execution in col.30, lines 39-54).

4. As to claims 15, 22, 24, Moller disclosed at least :

- a) evaluating the state of a parameter of context process (see the generation of CMUXCTL and STKMUXCTL in col.30, lines 39-54);

- b) performing swapping to cause a different context [invoked loop] and associated program counter to be selected in accordance with the parameter (see the selection and the replacement of the invoked loop count for execution in col.30, lines 39-54);

- c) register stack (see the stack in col.30, lines 39-54, fig.2A [stack] );

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d) arithmetic unit coupled to the register stack and a program control store for string the context swap instruction (see the ALU and program counter and memory and the microprogramming sequencer 10 in fig.1).

5. As to claim 20, Moller also included an inter thread (see inner loop in col.30, lines 25-54).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2, 3, 8, 17, 23, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moller et al. (4,868,735) in view of Adkins (5,247,671).

7. As to claim 2, 23, 25, limitations of parent claims 1, 15, 22, 24 have been discussed in previous paragraphs, therefore, they are not repeated herein. Moller did not specifically show the wakeup of the swap out context as claimed. However, Adkins disclosed a wakeup of a context (see col.8, lines 45-64). It would have been obvious to one of ordinary skill in the art to use Adkins in Moller for including the wakeup of the swapped context as claimed because the use of Adkins could provide Moller the control ability to restore the context of the associated task at a predetermined cycle, thereby reducing the latency caused during the resume of the task process, and it

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could be readily achieved by predefining the wakeup signals of Adkins into the swap instructions of Moller with modified read and write operands so that the specific wakeup command of the context of a given task of Adkins could be recognized by Moller, and because Moller did teach the activation of the context on the top of a stack by a selection signal caused by the swap instruction (see col.30, lines 39-44), which was a suggestion of the need of a function specific signal (e.g. wakeup, sleep, etc) into the swap instruction in order to achieve the enhanced context recovery or activation, and for the above reasons, provided a motivation. Moller is used as a primary reference because it clearly showed a swap instruction (see swap instruction] in col.30, lines 39-40). Adkins is used as secondary because it supplemented the teaching of the wakeup of the context.

8. As to claims 3,17, Moller did not specifically show the specifying of an occurrence in the instruction as claimed. However, Adkins disclosed context wakeup in response to new events (see col.8, lines 47-52). It would have been obvious to one of ordinary skill in the art to use Adkins for including the occurrence of event because the use of Adkins could provide Moller the control ability to restore the context of the associated event at a given command, therefore eliminating the hardware overheads during the resume of the task process.

9. As to claim 8, Moller was also directed to a `inter_thread` (see the inner loop in col.30, lines 25-68, col.31, lines 1-5).

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10. Claims 4,18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moller et al. (4,868,735) in view of Adkins (5,247,671) as applied to claim 3 above, and further in view of Angle (5,541,920).

11. As to claims 4,18, limitations of parent claims 1,3,15 have been discussed in previous paragraphs, therefore, they are not repeated herein. Neither Moller nor Adkins specifically showed the sram swap signal as claimed. However, Angle taught a sram swap signal for swapping the portion of the SRAM (see col.5, lines 1-8) . It would have been obvious to one of ordinary skill in the art to use Angle in Moller for including sram swap signal as claimed because the use of Angle could provide additional option of the swap instruction in Moller , and therefore, expanding the processing capability for accepting different memory type such as the SRAM.

12. Claims 5, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moller et al. (4,868,735) in view of Adkins (5,247,671). as applied to claim 3 above, and further in view of Manning (5,610,864).

13. AS to claims 5, 19, limitations of parent claims 1,3, 15 have been already discussed in previous paragraphs, therefore, they are not repeated herein. Neither Moller nor Adkins specifically showed the swap of the sram and dram as claimed . However, Manning disclosed a background art which taught a swapping of the SRAM and DRAM (see OTHER PUBLICATIONS, Page 2, lines 1-5). Since no specific format

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of the swap of the SRAM and DRAM has been reflected into the claim, it is assumed to be a swapping of the SRAM and DRAM in general sense. For example, DRAM can be swapped for SRAM. The swap out of the current context was already taught and discussed in previous paragraph, therefore, it will not be repeated hereon. As to the swapping of the SRAM and DRAM, it would have been obvious to one of ordinary skill in the art to use Manning in Moller for including the swap of the SRAM and DRAM because the use of Manning could enhance the adaptability of Moller for accepting different type of memory such as DRAM and SRAM. Manning is used because it was built based on the background art including the publication teaching of the swap of the DRAM for SRAM. No details of the publication has been used and cited to applicant because no specific format of the swap signal has been reflected into the claim. The idea of DRAM can be swapped for SRAM was already set forth clearly in the title of the publication, and one of ordinary skill in the art should be able to implement the swapping into Moller's swap instruction to achieve the storage access flexibility.

14. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moller et al. (4,868,735) in view of Adkins (5,247,671). as applied to claim 3 above, and further in view of Turner et al. (6,505,229).

15. As to claim 11, neither Moller nor Adkins specifically showed the available data in the receive FIFO as claimed. However, Turner disclosed a system including a ready FIFO queue for allowing a swapping for a thread (see col.7, lines 38-37). It would have been obvious to one of ordinary skill in the art to use Turner in Moller for including the available data in FIFO as claimed because the use of Turner could provide additional

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capability of the given swap command to initiate the swapping at the available cycle of the FIFO, therefore, minimizing the wait time in the access cycle, and it could readily be done by configuring the FIFO of Turner with modified interface ports into Moller so that the available data in FIFO of Turner could be recognized by Moller, and for the above reasons, provided a motivation.

16.

Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. None of the prior art of record further teaches the FBI swapping and wakeup when the thread's FBI was received indicating the FBI CSR, Scratchpad, TFIFO, or RFIFO has completed.

Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. None of the prior art of record further teaches the parameter "seq\_num1\_change/seq\_num2\_change" which specifies swap out of the current context and wakes it up when the value of the sequence number changes.

Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. None of the prior art of record further teaches the voluntary parameter for swapping out if another thread is ready to run, and if the thread



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is swapped , the swapped thread is automatically re-enabled to run at some subsequent context arbitration point.

Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. None of the prior art of record further teaches the auto\_push for swapping out and wakes up when SRAM transfer read register data has been automatically pushed by Fbus interface.

Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. None of the prior art of record further teaches the parameter specifying kill for preventing the current context or thread from executing again until the appropriate enable bit for the thread is set in the CTX\_ENABLES register.

Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. None of the prior art of record further teaches the pci parameter for swapping out and wakes up when the PCI unit signals a DMA transfer has been completed.

Claims 14 , 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of

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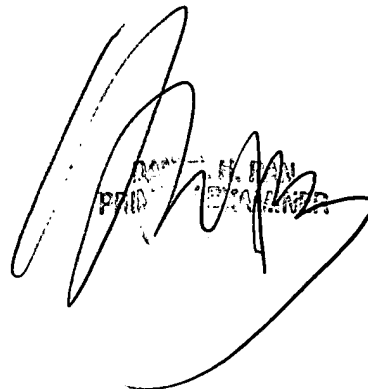
the base claim and any intervening claims. None of the prior art of record further teaches the optional\_token "defer one" for specifying that one instruction will be executed after this reference before the context is swapped.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dan Pan whose telephone number is 703 305 9696, or the new number 571 272 4172. The examiner can normally be reached on M-F from 8:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chan, can be reached on 703 305 9712, or the new number 571 272 4162. The fax phone number for the organization where this application or proceeding is assigned is 703 306 5404.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*21 Century Strategic Plan*

A handwritten signature in black ink, appearing to be "Dan Pan", is written over a rectangular stamp. The stamp contains the text "DAN PAN" and "PATENT EXAMINER" in a grid-like format.

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